

# *Lepidobatrachus asper* Budgett, 1899 (Amphibia: Anura: Ceratophryidae): New country record, distribution map and natural history notes

José Luiz Massao Moreira Sugai<sup>1\*</sup>, Gabriel Paganini Faggioni<sup>1</sup>, Liliana Piatti<sup>2</sup>, Anderson Aparecido Lemos<sup>3</sup>, Franco Leandro Souza<sup>2</sup> and Cynthia Peralta de Almeida Prado<sup>4</sup>

1 Universidade Federal de Mato Grosso do Sul, Centro de Ciências Biológicas e da Saúde, Programa de Pós Graduação em Ecologia e Conservação. CEP 79070-900. Campo Grande, MS, Brazil.

2 Universidade Federal de Mato Grosso do Sul, Centro de Ciências Biológicas e da Saúde. CEP 79070-900. Campo Grande, MS, Brazil.

3 Rua Manoel Silva Neto, 122 Parque São Lucas. CEP 03237-000. São Paulo, SP, Brazil.

4 Universidade Estadual Paulista “Júlio de Mesquita Filho”, Departamento de Morfologia e Fisiologia Animal, Faculdade de Ciências Agrárias e Veterinárias. CEP 14884-900. Jaboticabal, SP, Brazil.

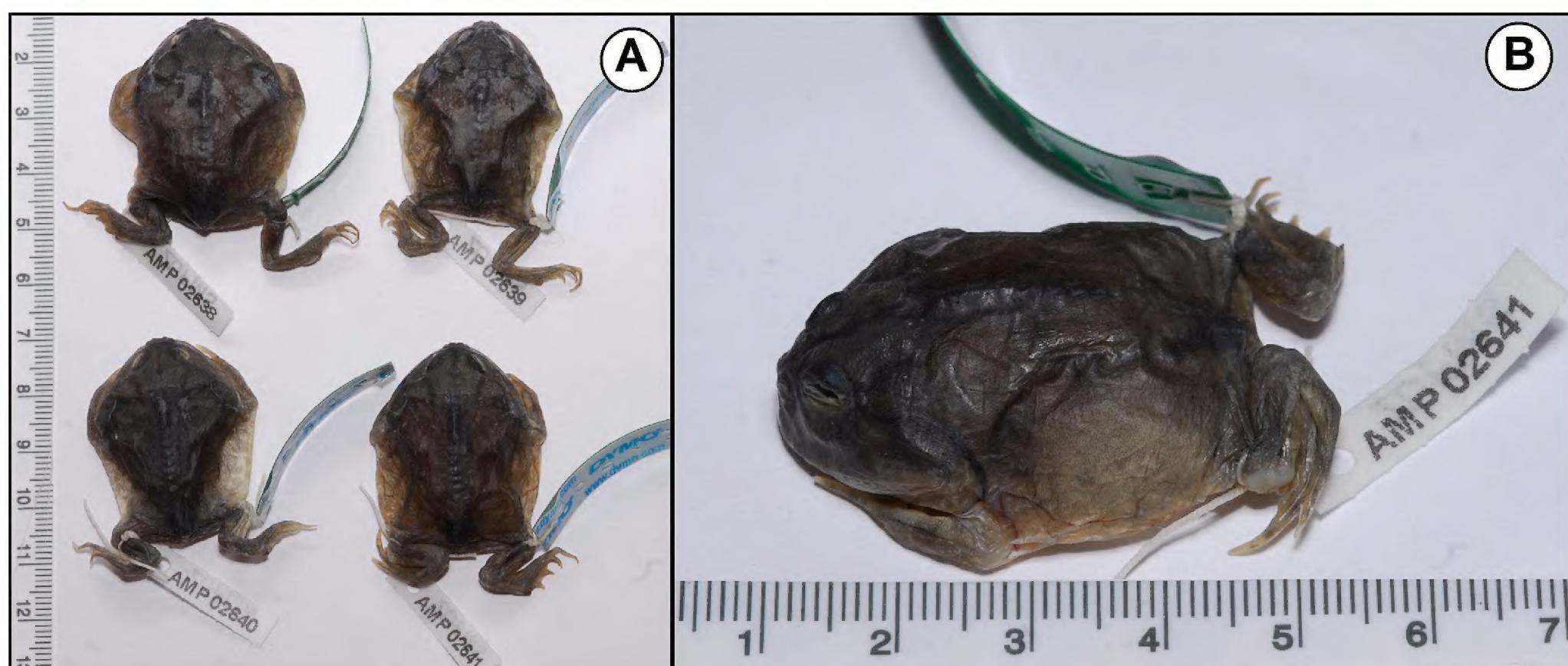
\* Corresponding author. E-mail: [jlmassao@gmail.com](mailto:jlmassao@gmail.com)

**ABSTRACT:** *Lepidobatrachus asper* is a large to medium frog known from the Chaco lowlands of Paraguay and Argentina. We provide the first species record for the Brazilian Chaco, which extends the species geographical distribution ca. 73 km northeast from Puerto Casado, Alto Paraguay Department, Paraguay. We also provide a distribution map and information about the species habitat conditions and diet. The Brazilian Chaco is still poorly surveyed, and the rapid environmental degradation can lead to local extinctions of certain species.

*Lepidobatrachus asper* is known from the Chaco lowlands of Paraguay (Central, Boquerón, Presidente Hayes, and Alto Paraguay Departments) and Argentina (Formosa, Salta, Chaco, Santa Fé, Santiago del Estero, Córdoba and Corrientes Provinces) (Aquino *et al.* 1996; 2004; Brusquetti and Lavilla 2006; Frost 2011). It is a large to medium frog (max. male SVL = 70 mm; max. female SVL = 90 mm), with stout body that differs from the other two *Lepidobatrachus* species (*L. laveis* and *L. llanensis*) by a combination of rhomboidal pupil, vertebral shield prominent and a spindle-like plate on the back (Cei 1980). Breeding activity occurs during the rainy season mainly in temporary ponds with clay soil, where it remains underground without feeding during the dry/cold season

similar to other species in the genus (Cei 1980). According to the IUCN Red List, this species is considered as “Near Threatened” because its remaining distribution range is estimated to reach no more than 20,000 km<sup>2</sup> and populations may be at risk due to fires and over-grazing by livestock (Aquino *et al.* 2004).

We collected four individuals of *L. asper* (Figure 1A and B; collecting permit provided by ICMBio number 19269-1) on February 10, 2012, in two temporary ponds (pond 1: 21°41'25"S, 57°43'16"W; pond 2: 21°41'17"S, 57°43'16"W; Figure 2 and 3B) located in the Patolá farm, municipality of Porto Murtinho, Mato Grosso do Sul State, Central Western Brazil. All individuals were deposited at the Coleção Zoológica de Referência da Universidade



**FIGURE 1.** *Lepidobatrachus asper* collected in February 2012 at the Patolá farm, Porto Murtinho municipality, Mato Grosso do Sul state, Brazil. A) Dorsal view of the four individuals. B) Detailed view of individual ZUFMS 02641. Photo by Paulo Robson de Souza

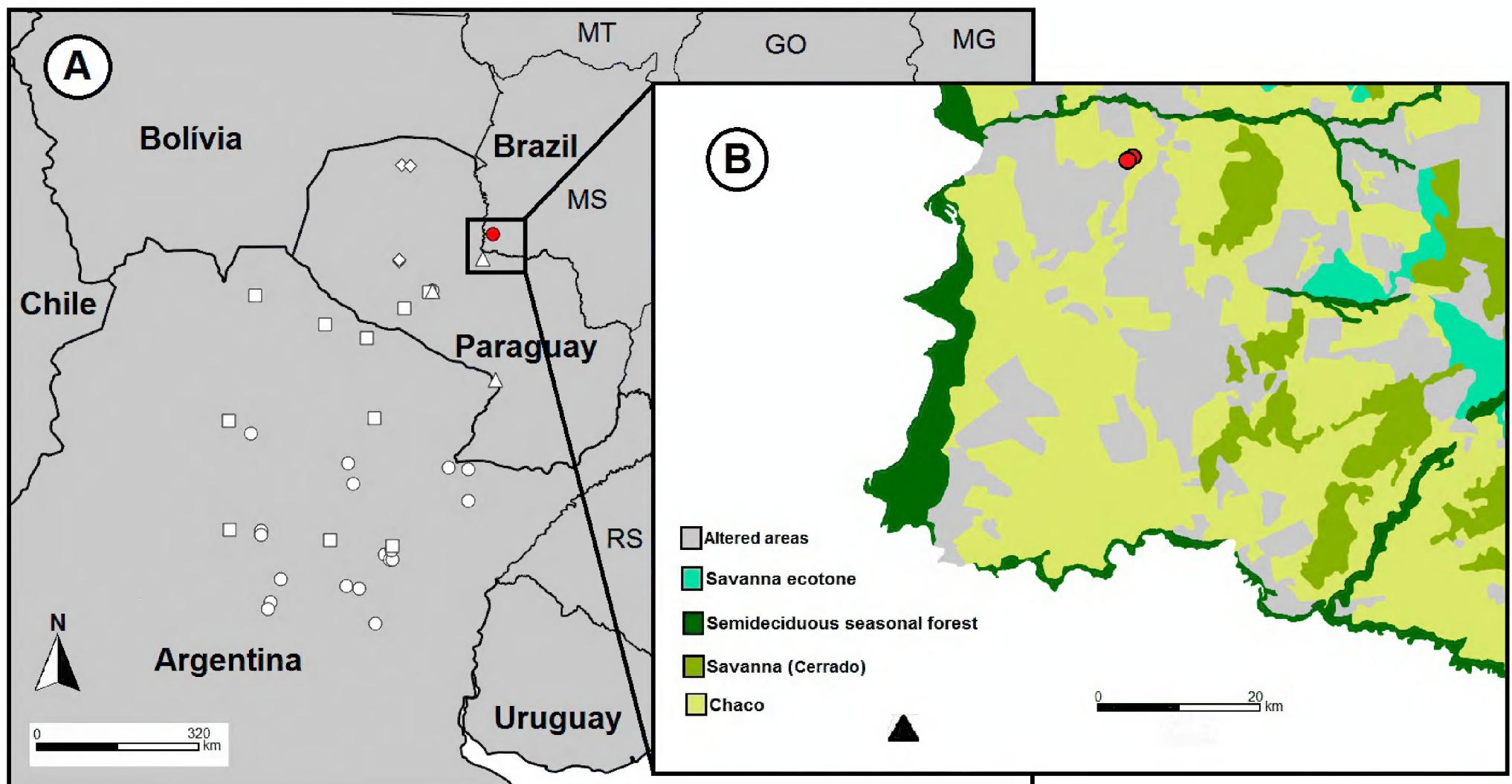


**FIGURE 2.** Temporary pond surrounded by pasture and Chacoan vegetation, at the Patolá farm, which represents the general aspect of the two temporary ponds where the juveniles of *L. asper* were collected. Photo by Gabriel Paganini Faggioni

Federal de Mato Grosso do Sul (acronym ZUFMS), Campo Grande, Brazil. This is the first record of *L. asper* for Brazil, which extends the species distribution ca. 73 km northeast from Puerto Casado, Alto Paraguay Departament, Paraguay ( $22^{\circ}18'0.00''S$ ,  $57^{\circ}58'0.00''W$ ; Figure 3). Two individuals (ZUFMS 02640 and ZUFMS 02641) were collected in pond 1 at 20:15 h. Both were found underwater at about 10 cm deep in contact with the bottom. The area of pond 1 was  $1347\text{ m}^2$ , water temperature was  $30.7^{\circ}\text{C}$ , air temperature was  $27.3^{\circ}\text{C}$ , and the relative air humidity was 69%. Both individuals were juvenile, with SVL (snout vent length) of 37.05 mm and 37.85 mm. The other two individuals (ZUFMS 02638 and ZUFMS 02639) were collected in pond 2 at 20:50 h, also underwater at about 10 cm deep in contact with the bottom. The area of pond 2 was  $1643\text{ m}^2$ ,

water temperature was  $32.9^{\circ}\text{C}$ , air temperature was  $26.8^{\circ}\text{C}$ , and the relative air humidity was 85%. Both individuals were also juveniles, with SVL of 39.05 mm and 34.35 mm. The four juveniles had empty stomachs, but material was found in the intestines and identified to order level. Plant material (flower, seed and sticks) and grains of sand were found in the intestines of two individuals (ZUFMS 02641 and ZUFMS 02640), which probably represent unintentional ingestion when preying on arthropods. Remains of aquatic coleopteran were found in the intestines of individuals ZUFMS 02638 and ZUFMS 02639. Terrestrial coleopteran was found in ZUFMS 02638. Araneae was found only in ZUFMS 02640, and Acari and Blattodea were found only in ZUFMS 02638.

The distribution map shown in Figure 3A was made based on records gathered from four sources (Faivovich 1994; Aquino *et al.* 1996; 2004; Brusquetti and Lavilla 2006) in addition to the new record (red circles on Figure 3A and B). Faivovich (1994) compiled 23 localities where the species occur in the Argentinean Provinces of Chaco, Córdoba, Corrientes, Santa Fé and Santiago del Estero, and three in the Paraguayan Departments of Alto Paraguay, Presidente Hayes and Central (Figure 3A, white circles; for details of the localities see Faivovich 1994). Aquino *et al.* (1996) registered the species in four localities in Paraguay (Figure 3A, diamonds): two in Filadelfia, Boquerón Departament, and other two at Parque Nacional Defensores del Chaco, Alto Paraguay Departament. Aquino *et al.* (2004) also registered *L. asper* in ten localities (Figure 3A, squares): two in Paraguay (Presidente Hayes Departament) and eight in Argentina (two in Formosa Province, one in Salta Province, one in Chaco Province, two in Santa Fé Province and two in Santiago del Estero Province). Brusquetti and Lavilla (2006) registered the



**FIGURE 3.** Map showing the known distribution of *Lepidobatrachus asper*. A) Distribution map in South America: literature records are represented by white circles (Faivovich 1994), squares (Aquino *et al.* 2004), triangles (Brusquetti and Lavilla 2006) and diamonds (Aquino *et al.* 1996), while new records are represented by red circles. B) Detail of the new records (red circles) in Mato Grosso do Sul state (MS), Brazil, showing the closest record in Paraguay (black triangle; Brusquetti and Lavilla 2006) and vegetation type in 2007 according to MMA (Ministério do Meio Ambiente; shapefile downloaded from <http://mapas.mma.gov.br/i3geo/datadownload.htm>). Note the large amount of altered areas, which probably have increased since 2007.

species at three localities in Paraguay (Figure 3A, triangles): one in Puerto Casado, Alto Paraguay Department, one at Estancia Juan de Salazar, Presidente Hayes Department, and one in Asunción, Central Department.

The southwestern region of Mato Grosso do Sul State harbors a flora and fauna typical of the Chaco domains, in addition to the influence of the adjacent Cerrado and Pantanal (Prado *et al.* 1992; Prado 1993a,b; Straube *et al.* 2006; Souza *et al.* 2010; Amaral *et al.* 2012). This area is the only under the influence of the Chaco domain in Brazil, which is isolated from the remaining Chaco by the Paraguay and Apa rivers. Some typical Chacoan species were recently registered in this area (Souza *et al.* 2010), including the first record for the toad *Melanophryniscus klappenbachi* (Amaral *et al.* 2012). In fact, the fauna of the region has been poorly studied and the occurrence of species frequently recorded in Chacoan areas is expected (Strüssmann *et al.* 2011). The natural vegetation of the Chaco, including the Brazilian part, has been suffering severe degradation, resulting from logging, agriculture and livestock (Bucher and Huszar 1999; Silva *et al.* 2008; CI, ECOA, Fundación AVINA, Instituto SOS Pantanal and WWF-Brasil 2009). Some recent records (Souza *et al.* 2010; Amaral *et al.* 2012; present study) have shown that the Brazilian Chaco is still poorly surveyed, and the rapid environmental degradation can lead to local extinctions of certain species before they are recorded. There are no conservation units in the Brazilian Chaco, which would be a way to protect its unique biodiversity.

**ACKNOWLEDGMENTS:** C.P.A. Prado acknowledges FAPESP (JP - proc. 2009/12013-4) and CNPq (proc. 471106/2010-0) for financial support. F.L. Souza receives researcher grant from CNPq (301071/2011-0). J.L.M.M. Sugai thanks CAPES for the scholarship. G.P. Faggioni thanks CNPq for the scholarship. We are also grateful to P.R. Souza for the pictures of *L. asper* individuals.

#### LITERATURE CITED

Amaral, I.B., P. Landgref-Filho, F.L. Souza and M. Uetanabaro. 2012. *Melanophryniscus klappenbachi* distribution. *Herpetological Review* 43(1): 98-98.

Aquino, A.L., N.J. Scott and M. Motte. 1996. Lista de anfibios y reptiles del Museo de Historia Natural del Paraguay (Marzo, 1980-Septiembre, 1995); p. 331-400 In O.R. Romero (ed.). *Colección de Flora y Fauna del Museo Nacional de Historia Natural del Paraguay*. Museo Nacional de Historia Natural del Paraguay, Asuncion.

Aquino, L., I. Tada and J. Faivovich. 2004. *Lepidobatrachus asper*. *IUCN Red List of Threatened Species*. Version 2012.1. Electronic Database accessible at <http://www.iucnredlist.org/>. Captured on 27 August 2012.

Brusquetti, F. and E.O. Lavilla. 2006. Lista comentada de los anfibios de Paraguay. *Cuadernos de Herpetología* 20(2): 3-79.

Bucher, E.H. and P.C. Huszar. 1999. Sustainable management of the Gran Chaco of South America: Ecological promise and economic constraints. *Journal of Environmental Management* 57(2): 99-108.

Cei, J.M. 1980. Amphibians of Argentina. *Monitore Zoologico Italiano, Nuova Serie, Monographia* 2: 1-609.

CI-Conservação Internacional, ECOA-Ecologia e Ação, Fundación AVINA, Instituto SOS Pantanal e WWF-Brasil. 2009. *Monitoramento das alterações da cobertura vegetal e uso do Solo na Bacia do Alto Paraguai - Porção Brasileira - Período de Análise: 2002 a 2008*. Brasília. 58 p.

Faivovich, J. 1994. La distribución del género *Lepidobatrachus* (Budgett, 1899) (Leptodactylidae: Ceratophryinae). *Acta Zoologica Lilloana* 43(1): 137-174.

Frost, D.R. 2011. *Amphibian Species of the World: an Online Reference*. Version 5.5. Electronic Database accessible at <http://research.amnh.org/vz/herpetology/amphibia/>. Captured on 27 August 2012.

Prado, D.E., P.E. Gibbs, A. Pott and V.J. Pott. 1992. The Chaco-Pantanal transition in southern Mato Grosso, Brazil; p. 451-470 In P.A. Furley, J. Proctor and J.A. Ratter (eds.). *Nature and Dynamics of Forest-Savanna Boundaries*. London: Chapman and Hall.

Prado, D.E. 1993a. What is the Gran Chaco vegetation in South America? A review. Contribution to the study of flora and vegetation of the Chaco. *V. Candollea* 48(1): 145-172.

Prado, D.E. 1993b. What is the Gran Chaco vegetation in South America? II. A redefinition. Contribution to the study of flora and vegetation of the Chaco. VII. *Candollea* 48(2): 615-629.

Silva, M.P., R.A. Mauro, M.M. Abdón and J.S. SILVA. 2008. Estado de Conservação do Chaco (Savana Estépica) Brasileiro; In *IX Simpósio Nacional Cerrado; Desafios e estratégias para o equilíbrio entre sociedade, agronegócio e recursos naturais*. Planaltina, DF: Embrapa Cerrados.

Souza, F.L., M. Uetanabaro, P. Landgref-Filho, L. Piatti and C.P.A. Prado. 2010. Herpetofauna, municipality of Porto Murtinho, Chaco region, state of Mato Grosso do Sul, Brazil. *Check List* 6(3): 470-475.

Straube, F.C., A. Urben-Filho, M.C.V. Rocha, A.P. Nunes and W.M. Tomas. 2006. Nova contribuição à Ornitologia do Chaco Brasileiro (Mato Grosso do Sul, Brasil). *Atualidades Ornitológicas* 134: 1-27.

Strüssmann, C., Prado, C.P.A., Ferreira, V.L. and Kawashita-Ribeiro, R. 2011. Diversity, ecology, management and conservation of amphibians and reptiles of the Brazilian Pantanal: a review; p. 497-521 In W.J. Junk, C.J. da Silva, C.N. Cunha and K.M. Watntzen (eds.). *The Pantanal: Ecology, biodiversity and sustainable management of a large neotropical seasonal wetland*. Sofia-Moscow: Pensoft Publishers.

RECEIVED: October 2012

ACCEPTED: November 2012

PUBLISHED ONLINE: March 2013

EDITORIAL RESPONSIBILITY: Raul Maneyro